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ABSTRACT

A summary of published reports of the evolution of the "Draw-A-Classroom" Test developed by the Toronto Board of Education is presented along with an extension of the previous literature reviews, an extensive bibliography, and a critical commentary on the test itself. Children's drawings of their classroom are evaluated as a form of communication. Data are reported which examine both the validity of regarding the drawings as projections of personality and the appropriateness of treating the "classroom view" as an instrument for examining the world of the child at school. Although there seems to be no generally accepted framework for inferring personality through art, its involvement in a process of communication is a constant feature. The Draw-A-Classroom Test may then be of value to both the teacher and the child because of its potential communication value and its use as a non-coded informal procedure to increase rapport and understanding in the classroom. Appendixes are included on the test's administrative procedure, coding framework, and details of time-linked changes. (LH)

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A CONSOLIDATED REPORT ON THE "DRAW-A-CLASSROOM" TEST — A STUDY OF THE DRAWING BEHAVIOUR OF CHILDREN IN TORONTO PUBLIC SCHOOLS

R. S. Rogers

April, 1969

FOREWORD

Information concerning the "Draw-A-Classroom" Test developed by the Research Department of the Board of Education for the City of Toronto is distributed across many reports written between 1963 and 1968. These reports detailed the evolution of the test and present data obtained from it. The purpose of the present report is to provide a summary of these publications. This report also includes an extension of the previous literature reviews, an extensive bibliography and a critical commentary on the "Draw-A-Classroom" Test.

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"Art therefore is intuition, in so far as it is a mode of knowledge, not abstract, but concrete, and in so far as it uses the real, without changing or falsifying it. In so far as it apprehends it immediately, before it is modified and made clear by the concept, it must be called pure intuition.

The strength of art lies in being thus simple, nude, and poor. Its strength (as often happens in life) arises from its very weakness. Hence its fascination. If...we think of man, in the first moment that he becomes aware of theoretical life, with mind still clear of every abstraction and of every reflexion, in that first purely intuitive instant he must be a poet. He contemplates the world with ingenuous and admiring eyes; he sinks and loses himself altogether in that contemplation. By creating the first representations and by thus inaugurating the life of knowledge, art continually renews within our spirit the aspects of things, which thought has submitted to reflexion, and the intellect to abstraction. Thus art perpetually makes us poets again.... Art is the root of all our theoretical life. To be the root, not the flower or the fruit, is the function of art."

(Benedetto Croce, Aesthetics, 1909)

"But why should the artist's intention not be capable of being communicated and comprehended in words like any other fact of mental life?"

(Sigmund Freud, The Moses of Michelangelo, 1914)

A CONSOLIDATED REPORT ON THE "DRAW-A-CLASSROOM" TEST -- A STUDY OF THE DRAWING BEHAVIOUR OF CHILDREN IN TORONTO PUBLIC SCHOOLS

INTRODUCTORY PREFACE

The Nature of the Behaviour of Drawing

Many acts leave permanent or semi-permanent records. When we walk on soft ground we leave a footprint; but usually the action and its consequence are not linked by conscious intent or the desire to communicate. We did not walk in order to leave a footprint, nor did we walk so that others would know we had been that way. By contrast, the motivation for the behaviour of drawing seems to lie not in the physical act but in the creation of a record for ourselves and others to see.

There may, of course, be other factors which lead to draving behaviour. In the case of the daubings of chimpanzees and pre-school children (Morris, 1962), these causative factors are not clearly understood; although the extent to which the drawings are stereotyped suggests that the organization of the perceptual-nervous system itself may have some influence, (i.e. there may be some scribbles which the higher apes and man are innately more prone to create than others). For the chimpanzee, the growth of graphic skills stops at the scribble stage; for the child, the growth continues on to representational art and beyond.

Within our society, the motivational pattern which reinforces graphic expression is complex. For some people the act of creation itself may be rewarding or be accompanied by a gratifying emotional release. In addition, the artist frequently obtains emotional, or material, revards from others who appreciate his work. The child in school may even by motivated to draw to avoid censure by his teacher.

The desire for graphic expression seems very deep-rooted in man's nature. Even our cave-dwelling forebears decorated their bone tools and cave walls with drawings. The earliest forms of writing and some forms of caligraphy, still in existence in primitive societies, are pictographic (Larousse, 1959). Clearly, where language and graphic art are intimately linked, a man's drawings are likely to be understood by his neighbour as a form of communication. Equally clearly, where this is not the case, as in our society, the "man in the street" (unless psychologically or aesthetically sophisticated) is unlikely to look for meaning in art over and above a superficial description of content.

The Artist Analysed

For over 60 year, children's drawings have been regarded by some researchers as a valuable guide to the child's personality and its growth. The adult artist too has not escaped the psychologist's attention (see literature reviews, Research Department, 1967, (a and b)).

Drawing analysis has many similarities to graphology (handwriting analysis). In both, it is believed that we unavoidably and unintentionally "decorate" a communication with our "style" or personality. The analyst classifies the creator according to certain characteristics of his output. These characteristics may be holistic (to do with the output as a whole) or concern certain specific parts of the content.

In graphology (Holt, 1965; Sonneman, 1950), as in drawing analysis (Research Department, 1967, (a and b)) there is an obvious absence of agreement between different researchers and writers on meaning, interpretation and psychological relevance. Both specific procedures and general rationale are subject to criticism. The question can be posed as to whether a sufficiently large and comprehensive piece of research could

do for drawing behaviour or handwriting analysis what the "Rosetta Stone" did for the understanding of hieroglyphics. In both art and graphology the search for interpretable symbolism continues.

Two distinct factors may be said to exist in children's drawings: a factor concerned with the evolution of reproductive skills and a factor representing individual variations on content, personal "style" and emotional "tone."

For those wishing to concentrate on the evolution of drawing skills and the growth of "intelligence," i.e. observational skill and concept attainment, that these skills reflect, the results of research conducted on the Goodenough-Harris "Draw-A-Man" Test (Harris, 1963) indicate that it would be the best instrument for such purposes. No similar test exists, however, which offers a well-validated approach to the second group of factors listed above, i.e. the expression of personality, and certainly not in relation to the school context. To investigate these contextual projections of the artist's personality, a procedure which involves questioning the child about the content of his drawing may yield more information than only using objective scoring of the content of the drawing. This possibility found expression quite early in the development of the D.A.C. Test when its originators found themselves asking such questions as:

> "All these drawings have windows, electric lights or other light sources. Do you think that means anything?"

One answer to this question might have been found by asking the "artists"; however, by the time such classifications had emerged, the drawings were too old to allow meaningful questioning of their creators. In fact, in the administrative procedure described in this report, questioning

concerning content was limited to the children's description of what they had drawn. The technique could, however, be expanded into a full discursive or unstructured interview procedure initiated by the drawing experience.

The Justification of Personality Analysis Through Art

Before proceeding further, it would perhaps be of interest to the reader to consider very briefly the basis for the belief that personality can be inferred through artistic output.

The literature on children's drawings is vast. The area is also one of controversy; three separate literature surveys have been made during the development of the D.A.C. Test and each reflects a different approach towards the relevant issues. The material covered in these surveys is not limited to the area of inferred personality and the reader desirous of further general or specific background is referred to the original documents (Dickinson, 1965; Research Department, 1967, (b)). A further useful review of literature may be found in a recent book by Lark-Horowitz, Lewis and Luca (1967).

Clinical sources provide the most dramatic evidence for the inference of personality from art. The psychotherapeutic reports of Jung (1959) contains numerous illustrations of the change in personal symbolism in drawing as an analysis proceeds. When considered along with the patient's associations to and introspections on his art, and Jung's interpretative commentary, there seems no way in which the conclusion can be avoided that drawings can be an expression of the deepest aspects of personality. In this regard it is well to remember that Jung's patients were not insane (psychotic) but neurotic members of normal society. The

study of artistic output during psychotic episodes also leaves little doubt that the fragmented world of the schizophrenic can be seen in his art (Naumberg, 1950; Wilson, 1964). Supporting evidence also comes from the use of children's art in psychotherapy (Rambert, 1949) and from the study of artistic output under the influence of "halucinogenic" drugs (for an illustration see Wilson, 1964).

Notwithstanding this kind of evidence, attempts to obtain a reliable test of personality based on the classification of the content of children's drawings have not been successful (Research Department, 1967, (b)). The most obvious reason for this seems to be that a child's drawing tells of the "now" mood rather than the "general" or "average" mood, leading to lack of repeatability on retesting. This phenomenon would, of course, cause no difficulty in a psychotherapeutic situation where personality is inferred from a number of sequential insights (i.e. an intuitive summation over a series of drawings).

In the report that follows, children's drawings of their classroom are evaluated as a form of communication. Data are reported which throw light both on the validity of regarding the drawings as projections of personality and on the appropriateness of treating the "classroom-view" as an instrument for examining the world of the child at school.

HISTORICAL BACKGROUND AND CRITICAL ORIENTATION TO THE RESEARCH

The Draw-A-Classroom (D.A.C.) Test was one of several measures developed in the Research Department for use in a longitudinal study which commenced in 1960. This study, commonly referred to as the "Study of Achievement" was primarily an investigation into the nature of achievement and the general development of pupils in Toronto schools with an emphasis on the long-term effects of attending Junior Kindergarten as opposed to not attending.

The D.A.C. Test was originally devised as a means of providing information about the development of children's perceptual and conceptual frameworks for analysing the world around them (Research Department, 1964). It was seen as providing a counterbalance to other more conventional measures used which in essence showed "how the system sees the child." The D.A.C. was intended to reflect "how the child sees the system." It may be seen as a creative synthesis of certain elements of the Goodenough-Harris "Draw-A-Man" Test (Harris, 1963) and the Lowenfeld "Make-A-World" Test (Lowenfeld, 1950) reoriented towards the child's view of his school.

In spite of the apparent simplicity of the D.A.C. Test approach, i.e. asking children to draw their classroom (instructions for administration are in Appendix I), the procedure resulted in a number of interpretative difficulties. These problems are discussed below.

The first problem arose from the adoption of an open-minded approach as to what areas of perception and conception would be demonstrated in the drawings. As no <u>a priori</u> assumptions had been made by the experimenters concerning what was to be regarded as of interest, the problem had to be

settled operationally, that is by undertaking an extensive and intensive coding process. As will be seen in one of the following sections of the report, this process yielded a content framework which reflected a complex pattern rather than a simple one, because of the interaction of the many elements of drawing behaviour; such as innate skill potential, specific training, and the growth of perceptual and conceptual skills.

The tests were administered in various schools, and within a school, in different rooms, year by year, according to the sample plan outlined in the next section. The absence of a standardized environment as a frame of reference, although required so that the test could be used in all school settings, caused an interpretative impasse between the decision that the world was seen differently and the decision that the world seen was different. This resulted in the exclusion of many possible categories, e.g., items such as aquaria, that were not features of all referent classrooms.

A similar problem became evident when it was found that there was no single item of content which occurred in every drawing, even when it occurred in every classroom. Thus, it was not possible to study how individuals changed their representation of a given item from administration to administration of the test. Instead, judgements had to be made on the basis of group comparisons, for example, X% of Group I drew their teacher and another adult while the percentage in Group II was Y%.

One of the initial attractions of the D.A.C. Test approach was its "non-verbal" nature. Initially this seemed to be an advantage, since many of the problems which could arise from the limited verbal abilities of Kindergarten children were eliminated. However, the original concept of the test as non-verbal had to be modified by the need to rely heavily

on the children's verbal descriptions of the content as a means of classification, particularly in Junior and Senior Kindergarten.

Although, perhaps, some of these difficulties could have been predicted, they may also have been an intrinsic part of the approach adopted, i.e. they could not have been avoided unless the essential simplicity and non-formality were sacrificed. In general, conventional tests are easy to score and rigid in administration. The range of behaviour they encompass is narrow because the responses permitted are predefined. The D.A.C. Test, by contrast, was unconventional in conception and set out to add to our understanding of the world of the child by an approach that removed traditional procedures of standardization. Its degree of success in this regard may be judged from the data that follow.

THE PROCEDURE USED TO COLLECT THE DRAWINGS

All the analyses and experimentation to be reported in this document are based on samples drawn from a total of some 40,000 drawings collected between Junior Kindergarten and Grade 4 inclusively. In all cases the teacher instructed each pupil in the class to draw his/her classroom and then to describe what they had drawn (see Appendix I).

The test was first administered in the Spring of 1961 to all 1,486 pupils in the Toronto School Board area who had entered Junior Kindergarten in September, 1960. In the Spring of 1962, those children tested in 1961 and now in Senior Kindergarten were retested, together with an additional 7,209 children who had begun their schooling in Senior Kindergarten in September, 1961. Two tests, separated by a month, were given in the two Kindergarten years; after this time and up to Grade 5 the children were tested once a year.

Data from eight administrations were thus available:

Time of Administration	Grade Position	Code for This Test
March, 1961	Junior Kindergarten	JK 1
April, 1961	Junior Kindergarten	JK 2
March, 1962	Senior Kindergarten	SK 1
May, 1962	Senior Kindergarten	SK 2
April, 1963	Grade 1	G 1
February, 1964	Grade 2	G 2
March, 1965	Grade 3	G 3
April, 1966	Grade 4	G 4

In the 1961 tests, all the selected children were in Junior Kindergarten. After that date normal promotion resulted in the majority of children falling in the grades shown. Some children tested in 1966,

however, had only reached Grade 3 while others had reached Grade 5. It is, nevertheless, convenient to label the study stages by the grade common to most of the pupils in a given year.

THE DEVELOPMENT OF A CODING FRAMEWORK

When the drawings from the Junior and Senior Kindergarten administrations had been collected, a sample of 500 drawings was selected and used as a basis for the evolution of a suitable scoring procedure. Several raters were used and at this initial stage the problem of inter-rater reliability was ignored.

Counts were made of the frequency with which various kinds of content appeared. As each code was developed, it was discussed among the coders to insure that its wording was not perceived ambiguously and that it did not replicate another code.

The coders included people from Canada, the United States, France, Estonia and India. Their academic and working backgrounds ranged through anthropology, English, political science, mathematics, psychology, history, education and newspaper photography and reporting. There is good reason, therefore, for believing that those aspects of the drawings abstracted by the coders were comparatively free from ethnic and disciplinary bias.

As the various aspects of drawing content so abstracted were examined, it became clear that an objective analytic framework must revolve around three basic aspects of content:

Objects: what objects, if any, are present;
Persons: what persons, if any, are present;
Space: how the objects and/or persons are presented and disposed.

A synopsis of the final framework giving the specific aspects of content that were included under each of the above basic divisions can be found in Appendix II.

Two aspects of the reliability of the coding framework have been investigated:

(a) Interrater Reliability -- the degree to which raters agree in their scoring;

(b) Test/Retest Reliability -- the degree to which a child's performance is consistent from one administration of the test to another.

(a) Interrater Reliability

Two separate tests have been made of this aspect of reliability, one with an earlier version of the coding framework and one with the present coding framework. The results of the two tests are similar and indicate good consistency between raters.

(i) Test 1 (Earlier Framework -- Dickinson, 1965)

Two hundred drawings were selected at random from those drawn in Junior and Senior Kindergarten and Grade 1. Five raters with previous experience on the test were asked to code the drawings. All five raters coincided as to code in 90% of instances.

A total of 79 of the drawings featured representations of the human figure and these were given Goodenough-Harris point scores (Harris, 1963). The correlation in point scores between each pair of raters varied between .89 and .92, reflecting a high degree of agreement.

(ii) Test 2 (Current Framework)

A similar test of coding consistency to that described above was performed on 120 randomly chosen drawings from children up to and including Grade 3. Average consistency for five raters (only four on some scales) was 82% (Research Department, 1966, (b)).

(b) Test/Retest Reliability[1]

In both Junior Kindergarten and Senior Kindergarten, two administrations of the test were made at an interval of one month. This interval may be thought of as long enough to reduce recall of previous output to minor proportions and yet short enough for one to assume that no major change in skill or personality had occurred.

Two hundred "paired" (done by the same child at an interval of one month) Junior Kindergarten drawings and an additional two hundred "paired" Senior Kindergarten drawings were randomly selected and coded by a single rater. On the average, over all items, 56% of the coded responses were identical. Examination of the individual codes indicated that where the code recorded the way in which the pupil dealt with the elements in the drawing, e.g., showing people in interaction, using specific techniques to represent the human figure and using colours to differentiate parts of an object or a person, there was small variability over a one month period. The presence of specific items such as the blackboard, a clock, or houses showed somewhat more variability from one drawing to the next than the way in which content was handled. The specific colours selected for each drawing show little consistency.

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1 Pramuan Dickinson. "A Study of Drawings Made by Children of Junior Kindergarten, Senior Kindergarten and First Grade of Toronto Public Schools." Unpublished doctoral dissertation. University of Toronto, 1965.

PROCESSING THE DATA — THE SELECTION OF DATA SAMPLES

A total of some 40,000 drawings were collected during the duration of the study. Since the coding and analysis of the complete sample of drawings would have represented a formidable task, it was decided to concentrate on selecting small samples of drawings to test specific hypotheses.

The table that follows, details the samples that were drawn:

TABLE 1

SAMPLING MATRIX

Sample Sizes by Grade JK 1	JK 2	SK 1	SK 2	G 1	G 2	G 3	G 4	Sample #	Nature of Sample
100	100	100	100	100	100	100	100	1	- 100 pupils who completed all eight administrations of the test
		558						2	- 558 pupils who also went to Junior Kindergarten
		558						3	- 558 pupils who lived in areas where Junior Kindergarten was available but did not go. Matched on certain demographic variables with Sample 2
			531					4	- those of Sample 2 who also completed a drawing in SK 2
			531					5	- those of Sample 3 who also completed a drawing in SK 2
		556						6	- 556 pupils who also went to Junior Kindergarten
		556						7	- 556 pupils who lived in areas where Junior Kindergarten was not available. Matched on certain demographic variables with Sample 6
			521					8	- those in Sample 6 who also completed a drawing in SK 2
			521					9	- those in Sample 7 who also completed a drawing in SK 2
*1102	1102							10	- 1102 pupils who completed both Junior Kindergarten drawings.
		*718						11	- 718 pupils from Sample 10 who also completed a SK 1 drawing
1500	1400	8700	8600	7100	6400	5600	1600		NUMBER OF DRAWINGS (TO THE NEAREST HUNDRED) FROM WHICH THE ABOVE SAMPLES WERE DRAWN.

N.B. The Samples were not mutually exclusive. For example, some Sample 1 drawings are included in the remaining Samples.

* These data have not been further analysed but are available for normative use from the Research Department.

ANALYSES AND STUDIES

The next four sections contain summaries of two major analyses (A and B) made using the full coding scheme for analysing drawing content and two studies (C and D) which used the drawings but did not use the coding scheme. Briefly, these sections deal with:

A Changes in drawing content with the age of the artist.

B The effect on drawing content of attendance or non-attendance at Junior Kindergarten.

C The mathematical achievement scores of those who did and those who did not include numbers in their drawings.

D The ability of various judges to differentiate the drawings of children referred to Child Adjustment Services from those who were not.

The first three sections are based on data available in detail elsewhere (Research Department, 1968, (c); 1968, (b); and 1968, (a) respectively). They are, therefore, less detailed than section D which appears here in print for the first time.

A — THE EFFECT OF THE MATURITY OF THE "ARTIST" ON CODED CONTENT

Of the 8,685 pupils included in the population under study, 1,486 began their schooling in Junior Kindergarten. From this latter group, a random sample of 100 children was chosen with the two restrictions that the selected child should never have changed schools during the test period and never have missed a drawing test administration.

It was thus possible to study changes in drawing content for the same 100 children across time. The data consisted of the frequency with which every item of coded content appeared at every stage from Junior Kindergarten and Grade 4.

Many of the codes showed considerable time-linked changes. As these time trends were considered, it became clear that three different kinds of changes seemed to dominate the results. These were:

Realism — objects looked more and more as they would in a photograph.

Sophistication — an increasing skill at differentiating objects and their interrelationships was displayed.

Conformity of Content — an increasing tendency to conform to the letter of the instructions, (i.e. to draw the classroom and nothing else) appeared.

The changes in content which were felt to support the above synthesis are reported in Appendix III (see also the full report, Research Department, 1968, (c)).

B -- THE INFLUENCE OF JUNIOR KINDERGARTEN

Pupils who attended Senior Kindergarten in 1961-62 can be described with reference to two geographic areas of the City of Toronto: one area where Junior Kindergartens were available and one area where they were not available. Within the area where Junior Kindergarten was available, some children did in fact attend while others did not.

Area 1	Area 2
No Junior Kindergarten Available	Junior Kindergarten Available
Sub-population "couldn't go"	Sub-population "didn't go"
	Sub-population "went"

Figure 1: Population Breakdown

To evaluate the effects of attendance, two comparisons were made:

A.....Between those who went and those who didn't go

B.....Between those who went and those who couldn't go.

} These comparisons are referred to as Matches 1 & 2 in earlier reports on the Study of Achievement

As other work had already been conducted on these comparisons using conventional academic measures (Research Department, 1966, (a)), matched pairs[2] of students with very similar socio-economic profiles were available from the sub-populations given in Figure 1.

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2 The matching criteria used were: sex, age, language, education of father, education of mother, occupation of father. As the original populations from which the matchings were made were large (1,486 "went"; 2,425 "didn't go"; 4,784 "couldn't go") an exceptionally good standard of matching was obtained.

The number of pairs involved were as follows:

	First Test Administration in Senior Kindergarten	Second Test Administration in Senior Kindergarten
Match A: "went" vs. "didn't go"	558	531
Match B: "went" vs. "couldn't go"	556	521

There was a partial overlap between the pupils in the "A" "went" group and those in the "B" "went" group, about 300 students being common to both comparisons.

The data were analysed using a test of proportions. The results of this analysis yielded some slight differences attributable to attendance at Junior Kindergarten. These differences did not invariably appear in the same categories of content for the "didn't go" comparisons as they did for the "couldn't go" comparisons (Research Department, 1968, (b)).

This result is in contrast to the results of previous studies by the Research Department with more conventional measures of school achievement which indicated that only the "didn't go" group differed from the "went" group (Research Department, 1966, (a)).

It was also found that on the second test administration, made one month after the first, the effect of attending Junior Kindergarten was less marked, presumably indicating that the small differences noted on the first administration were not of a permanent nature.

The effects found to be associated with prior attendance at Junior Kindergarten were not always the same as those relating to the maturity of the artist (see page 17).

As the samples had been matched for sociometric indices, the source of the observed effects has to be sought outside such variables, possibly among other home environment variables as yet imperfectly understood.

C -- THE RELATIONSHIP BETWEEN THE FEATURING OF NUMBER SYMBOLS IN THE DRAWINGS AND TESTS OF MATHEMATICAL ACHIEVEMENT

It was observed that in some of the Kindergarten drawings the children had included number symbols. A study was, therefore, undertaken to determine if the presence of these numbers in the drawings, before their formal introduction into the curriculum, would serve as an indicator of a child's mathematical achievement in Grade 1 (Research Department, 1968, (a)).

To answer this question, pairs of students were selected and matched on a number of criteria (sex, age, school experience, socio-economic status, etc.). This procedure resulted in two groups of 43 with the only apparent difference between them being that one group had included numbers in their Kindergarten drawings whilst the other group had not. Males and females were included in both groups.

All subjects were given a set of tests in Grade 1 (a year after completing the drawings) to determine their level of understanding of numeric concepts. One test, the Metropolitan Achievement Test, is commercially available and is traditionally used to measure arithmetic achievement. The other test, a more novel one, was developed by Dodwell (1960; 1961), a Canadian experimental psychologist, on the basis of work done by Piaget (1952). In essence, this test measures the degree to which the child is able to understand the underlying principles of mathematics, quantity and number. Questions on the test take the following format:

> "Equal numbers of beads are put by the child into two equal sized beakers. The child is then asked if the beakers contain the same number of beads. The beads from one of the beakers are then poured (while the child watches) into a tall, thin beaker. The child is again asked if the two beakers containing beads have the same number of beads."

This kind of questioning is performed using beads and blocks of different sizes, shapes, and colours in rows and groups of different numbers. Each child is given a score on the test which is the sum of his correct answers on the test. The total score reflects the child's understanding of the concept of number.

The average of all the scores within a group for each test was calculated. The group which had included number symbols in their drawings was compared with the group which had not. It was found that there were no meaningful differences between the groups on the basis of the tests. When the groups were compared again on the basis of test scores, but subclassified according to the sex of the subjects, it was found that there were no differences between males and females.

On the basis of these results, it was concluded that the spontaneous production of number symbols in the classroom drawings of Kindergarten children could not serve as an indicator of their number concept understanding in Grade 1. Beyond this it was concluded that, at least in the Grade 1 level, there were no differences between males and females in their understanding of the concept of number.

D -- THE VALUE OF THE DRAWINGS AS AN EARLY INDICATOR OF THE LIKELIHOOD OF LATER REFERRAL TO CHILD ADJUSTMENT SERVICES[3]

In the Toronto School System, referrals to Child Adjustment Services (C.A.S.) are made for a variety of reasons ranging from learning difficulties to apparent behaviour problems. These referrals can be made at any time in the school-life of a child and it has been assumed that if it were possible to identify, in Kindergarten, those children who would later be referred to C.A.S., the effectiveness of remedial treatment would be enhanced and the efficiency of the C.A.S. referral procedure improved.

In the development of the D.A.C. Test, many of the coders and other workers who were exposed to the drawings expressed the feeling that some of the drawings seemed to be indicative of various kinds of mal-adjustment in the children who drew them. This observation coupled with the affinity of the D.A.C. Test to diagnostic tools such as the "Draw-A-Person" Test (Machover, 1953) and the "House-Tree-Person" Test of Buck (1948), led to the decision to evaluate the value of the D.A.C. drawings as indicators of later referral to C.A.S.

The design chosen for this study and now reported, was based on the belief that it would be difficult to successfully identify future referrals using the coded categories for the drawings. To demonstrate any effect it was decided that the best procedure would be to work with the actual drawings rather than with coded content derived from them. In this way, it was hoped to minimize the loss of information and maximize the likelihood of identification. The opinions expressed about unusual drawings had been based on the whole drawing not on any of the limited coding categories.

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3 This study is not reported elsewhere and it is, therefore, presented in greater detail than the other research given in this publication.

Once the decision had been made to work with the actual drawings, the study became a discrimination experiment — could people differentiate the drawings of children who had been "referred" from the drawings of children who had not been "referred"?

The most simple test of this question, that of asking a number of judges to sort "referred" from "non-referred" drawings was rejected because a negative finding could not be interpreted unambiguously. This potential ambiguity could come about because the "referred" group contained children who represented both extremes of certain dimensions of adjustment, i.e. the very dull and the very bright, the pathologically introverted and the pathologically extroverted. To give a specific example of the problem, a judge finding one drawing to be more poorly executed than another could not know whether the more poorly executed drawing is from a normal child paired with a very bright child or from a very dull child paired with a normal child, unless there was a control referrent (something that tells what the normal or average skill of execution should be) and no such criterion was available.

The existence of such "opposites" among the "referred" drawings would result in any consistent strategy for judging, (e.g., always calling the more poorly executed of two drawings the "referred" one) leading to a finding of no overall discrimination due to a "cancelling" effect. If the above strategy were used, all "extremely bright/normal" pairings would be viewed incorrectly and all "extremely dull/normal" pairings would be viewed correctly, leading to a 50:50 or "chance" score overall.

The more complex design finally adopted and now described, avoided the difficulties just considered by informing the judges what kind of "referral reason" was involved when they were trying to decide which of two drawings

came from a "referred" child. This approach also met the objective stated earlier of maximizing the information available to the judges so as to make any discrimination more apparent.

The drawings used in the study were confined to those obtained in Junior and Senior Kindergarten, as the concern was for early identification of potential referrals. The drawings by "artists" known to have been referred to C.A.S. were identified from each of the four drawing test administrations given in the two Kindergarten years. Six categories used to group the numerous kinds of reasons which have been used for referral to C.A.S. are:

(a) Developmentally/Functionally Sub-normal -- poor school progress, special learning difficulty, poor work habits, neurological/perceptual defect, speech difficulty, language problem, mentally retarded, marked immaturity of personality;

(b) Projected Personality Problem -- lying, stealing, bullying, fighting, sex problems, destructiveness, refusal to accept rules and regulations;

(c) Introjected Personality Problem -- thumb-sucking, nail biting, tics, head-rocking, masturbation, feeding problem, poor sleeping habits, fears, feelings of inferiority, timidity, tension symptoms, daydreaming, bizarre behaviour, schizophrenia, emotionally disturbed;

(d) Poor Social Relationships -- inability to get on with others, overly aggressive, withdrawing behaviour;

(e) Environmental Disadvantage -- poor home conditions, poor family relationships, attendance problem;

(f) Intellectually Above Normal -- referred for psychometric test and found to be superior.

For each of the four test administrations (two given in Junior Kindergarten and two given in Senior Kindergarten), eight examples of drawings were randomly selected that fell into each of the above categories (eight drawings by children who were referred for a reason listed under (a) and similarly for (b) to (f)). Every such "referred" drawing was paired with

the drawing of a "normal" unreferred child that lay closest above it or below it in an alphabetic list of all students. Thus for each administration of the test, eight pairs of drawings were selected for each referral reason, that is 48 pairs. With four different administrations included there were, therefore 4 x 48 or 192 pairs in total.

In practice, three pairs of drawings were omitted from the first Junior Kindergarten administration series as they were found to contain additional teacher comments that could have aided discrimination.

Five judges with varying degrees of association with children's drawings were used in the study:

A mother with two children;

A psychologist with no specific interest in children;

An unmarried "naive" girl from a personnel agency;

A teacher with several years Kindergarten experience;

A psychologist with student counselling experience.

One judge because of his limited availability was only exposed to half of the drawings.

Procedure

Each judge was seated in front of a microfilm reader on which the drawings were presented in colour and in approximately their original size. (All 40,000 drawings collected in the D.A.C. Test programme are stored in microfilm form.) The judges' task was to identify which of each pair of drawings came from a "referred" child. For each pair of drawings, the judges were told to which of the six categories of referral one of the

drawings belonged (i.e. "One of these two drawings came from a child referred for an introjected personality problem. Which one?").

Care was taken to obscure from the judges the corner of the drawings containing information concerning the name, and sex, of the pupil and his school. In this way, discriminatory cues were limited to the drawings and the description each child had given of the content, which the teacher had written on the drawing. The results of this experiment are given in Table 2. The data were analysed using the X^2 test as follows:

A: X^2 for the overall totals (479:370) on the Null Hypothesis of guessing (i.e. 50:50) is 13.74. This value is significant at the 0.1% level with one degree of freedom, indicating that the observed ratio of 479:370 would occur with random choosing less than one time in one thousand. The Alternative Hypothesis that there was discrimination can be accepted. (The comparison of an observed ratio against a hypothetical one is described in M. J. Moroney's "Facts from Figures," 1962).

B: X^2 was also calculated for the ratio in Categories A + F (the categories involving "intelligence") versus Categories B + C + D + E (the categories involving "personality" and home environment). The Null Hypothesis was that the ratio for A + F (170:108) was the same as that for B + C + D + E (309:262). The resultant value for X^2 was 3.58 on one degree of freedom. This value just fails to reach the 5% level. Thus the judges did best in the categories concerning intelligence. The difference was large enough to indicate that this finding would probably be replicated with other judges.

NOTE: As there was no definitive <u>a priori</u> ordering that could be applied to the judges concerning those most and least likely to succeed in the task, the results of individual judges were not subjected to a test. It was, however, noted that the range between the most and least successful judges was small and that task-success was not always related to presumed experience or theoretical knowledge.

TABLE 2

DRAWING DISCRIMINATION DATA FOR THE FIVE JUDGES

Description of Judge	Referal Category* A ✓	A X	B ✓	B X	C ✓	C X	D ✓	D X	E ✓	E X	F ✓	F X		Total (A+B+C+D+E+F) ✓	Total (A+B+C+D+E+F) X
Mother with two children	20	10	17	14	19	13	18	14	16	16	19	13		109	80
Psychologist with no specific interest in children	17	13	16	15	17	15	19	13	18	14	24	8		111	78
Single girl "naive" subject	19	11	15	16	18	14	16	16	14	18	17	15		99	90
Teacher with several years Kindergarten experience	21	9	16	15	19	13	24	8	17	15	15	17		112	77
Psychologist with C.A.S. experience	9	5	8	7	8	8	5	11	9	7	9	7		48	45
TOTAL	86	48	72	67	81	63	82	62	74	70	84	60	GRAND TOTAL	479	370

* Within each referral category correct identifications are tabulated as ticks (✓) and incorrect identifications are crosses (X).

Three characteristics of these data are noteworthy:

(i) a low but statistically reliable level of discrimination is demonstrable overall;

(ii) the ability to discriminate does not seem to be appreciably affected by the judges' presumed familiarity with children's art;

(iii) average discrimination scores are probably higher in the referral categories concerned with ability than in the categories concerned with personality or environment.

The first and major finding, indicating that it was possible to detect some of those who were later referred to psychological services, is congruent with other studies reported in the literature (Dillard and Landsman, 1968; Westman et al., 1967-68). These researchers used a developmental rating and a figure drawing test respectively, as their criteria for early identification of likely referrals.

To be of practical value, however, such screening devices must achieve more than a marginal degree of accuracy and the D.A.C. Test judged on this basis is far from precise. Under the conditions which had been designed to produce the maximal chance of correct detection, the discrimination level was only 13% above chance, the meaning of this level and its derivation may be seen below:

> The overall result was 479 correct responses and 370 incorrect responses. If the judges were only guessing this should lead to the same number of correct and incorrect responses: there were, however, 109 more correct responses than incorrect responses. The ratio 109 to 849 (the total number of responses) gives the 13% discrimination rate. (If there were no errors the rate would be 849:849 or 100%.)
>
> Overall, 849 pairs of drawings were considered, made up of 849 "normals" and 849 "referrals."[4] If children had been sent to

4 As each drawing was seen by four or five judges there were in fact, only 192 pairs of different drawings overall but this does not affect the argument.

psychological services on the basis of the judgements given in the experiment, 365 of the 849 "normals" would have been needlessly examined, while the 365 of the 849 "referrals" would have been missed.

In practice an even lower rate of success would be expected as:

(a) the true level of potential "referrals" is lower than the 50% used in the experiment (which can be shown by a statistical argument not presented here to lower the detection rate);

(b) with no information as to the kind of "referral" to be expected a lower detection rate would result in the way explained earlier.

The implication of these calculations and considerations is clear; evaluators' judgements of the drawings collected in the D.A.C. Test programme are of no practical use as a basis for a screening aid aimed at the early detection of potential referrals to Child Adjustment Services.

The second finding of this study was that the judges in spite of varied experience with children and their drawings did not differ from one another as much as might be expected; the small differences among judges did not always favour the ones who might seem "most experienced." This may well indicate that the judgemental criteria were simple. Remembering also that the referral categories reflecting ability were the most effectively discriminated (characteristic iii, page 29) it would seem likely that some criterion of "goodness of drawing" was a major basis for classification.

It was decided to end work with the drawings at this point as there seemed to be only minimal likelihood that further analysis of the coded content would yield powerful predictors where work with the actual drawings had not produced them. This decision was also made in light of the fact that the original motivation for this part of the research came from looking at unusual drawings not unusual coded content.

SYNTHESIS AND CONCLUSION

The research activities which have just been summarized provide an answer to the question implicit in the objectives given for the D.A.C. Test, namely -- "what happens when children are asked to draw their classroom?"

It has been shown that the content of such drawings in Senior Kindergarten is influenced slightly by whether or not the child has been previously exposed to Junior Kindergarten and that this influence rapidly diminishes with time.

Changes have also been isolated that correlate with the age of the child making the drawing.

Thus evidence has been accrued which indicates that where we have good reason to expect groups of children to differ (because of age or prior experience) differences can be found in their dravings. That the reverse (differences in drawing content leading us to suspect other differences) need not be true was seen in the use of numeric symbols in the drawings. Whatever conceptual awareness the use of numeric symbols may indicate was not reflected later in measured numeric ability.

In the case of the experiment on the drawings of children later referred to Child Adjustment Services, the drawings were shown to have some small predictive value but at such a low level that they would be of no practical value as a screening device.

With these results in mind we can evaluate the D.A.C. Test using one of the conclusions drawn from the review of literature (Research Department, 1967, (b)), namely that there appears to be no generally accepted

method for inferring personality through art. Despite this, many individual psychotherapists seem confident that their particular framework has had value in providing insight into the patient's condition and has in turn helped the patient to self insight and clinical improvement. Nevertheless, there are great differences among the various frameworks suggested and their theoretical bases (Jungian, Freudian, pragmatic). The only constant feature appears to be that a process of communication is involved: the drawings act catalytically, stimulating verbalisation and the growth of understanding so helping the establishment of a therapeutically beneficial relationship.

> "To understand the child's drawings it is necessary to be initiated not only into his logic but also into his symbolism.... We would never be able to understand a child's drawings if he did not explain them."
>
> (Rambert, 1949)

Various features of the Draw-A-Classroom Test suggest that it might be of value to both the teacher and the child because of its potential communication value in a way somewhat similar to the therapeutic situation described above. First the child attempts to draw an environment that may well be the locus of some of his problems and conflicts, second the child communicates to his teacher what he has drawn; and third the teacher has an experiential background in the graphic medium as used by children.

It would be a mistake to push the analogy too far, as the Draw-A-Classroom was not designed with the direct intention of producing an aid to communication between teacher and child. Interestingly, some of the informal "feed-back" received from participating teachers emphasized this aspect of the test as an aid to communication. Much of the literature and data under review also suggests (at least to the writer) that the D.A.C.

Test (if it has a future at all) should be seen and used not as a test but as a non-coded informal procedure to increase rapport and understanding in the classroom.

APPENDICES

APPENDIX I -- ADMINISTRATIVE PROCEDURE

The "Draw-A-Classroom" Test is administered by the teacher to a class as a group with no time restrictions. Although the instructions sent to teachers varied slightly from year to year the following instructions are typical:

1. It is important that the drawings be as self-expressive as possible. No preliminary discussion should take place as to what is to be put into the drawings. While the children are making their drawings, care should be taken not to coach the children.
2. Drawings will be made on newsprint paper, white, size 12 x 18.
3. Crayons will be used to make the drawings. Each child should have available the following crayon colours for making the drawings: red, green, blue, yellow, orange, purple, brown and black.
4. After paper has been distributed to the children and crayons are placed in an accessible position, SAY THE FOLLOWING DIRECTIONS EXACTLY:

   > "I am going to ask you to do something very special for me. I want you to make a picture of our room. Look all around the room and then draw a picture of our room on the paper."

5. Do not coach the children as they make their drawings. Give encouragement only by your attitude.
6. When a child finishes his drawing, put his name and school in the upper right hand corner of the drawings.

Ask the child:

"Tell me about the picture you have made."

ON THE DRAWING, RECORD ALL OF THE CHILD'S RESPONSES TO EVERYTHING HE HAS DRAWN AS ACCURATELY AS POSSIBLE. TRY TO WRITE HIS WORDS NEAR THE OBJECTS HE IS DESCRIBING WITH A FINE BLACK FELT MARKER PEN.

(If necessary grade six monitors may assist.)

7. Do not display the drawings. When they are all completed, send them to:

Research Department,
Toronto Board of Education,
155 College Street,
Toronto 2B, Ontario.

8. Any child who is absent during the week of the test should draw a picture of the classroom individually upon return to school.

APPENDIX II -- THE CODING FRAMEWORK

The final coding framework consisted of the following specific aspects of content:

(i) Space

- Framing or Enclosure
- Partitioning
- Physical Boundaries
- Amount of Space Used
- Scope or Subject Matter
- Shading
- Compression
- Viewpoint

(ii) People

(a) Persons

- Appearance of Boy(s)
- Appearance of Girl(s)
- Appearance of Unspecified Children
- Sex of Unspecified Children
- Size
- Activity and Interaction
- Labelling

(b) Drawing the Person

- Head
- Facial Features (Stereotyping)
- Neck
- Arms
- Fingers, hands
- Legs
- Feet (Position, Proportion)
- Trunk (Stereotyping)
- Body Representation
- View of Person
- Clothing
- Transparency
- Detail
- Use of Colour

(iii) Objects
(a) Objects

Transparency
Fold Out
"Behind/In Front," "On/Under"
Perspective
Colour
Time
Labelling
Atmosphere

(b) Classroom Constants

Inclusion
Shading
Use of Colour
Grouping

Within each of these five content areas just given there were some 15-20 different sub-areas and within each of these sub-areas, 2-10 individual codes. For example:

Content Area	Sub-Area	Individual Codes
		- no frame lines present
		- only one frame line present
Space	Joined Frame Lines	- more than one frame line present but not joined
		- more than one frame line present and joined.

Each drawing was classified as belonging in one but not more than one individual code within each sub-area.

Complete details of the codes are given in the Coding Manual (Research Department, 1966).

Each individual code within a sub-area had a percentage frequently attached to it. The total codes in a sub-area always totalled 100%.

APPENDIX III -- DETAILS OF TIME-LINKED CHANGES

(i) Realism

Instances of:

Accuracy of determining sex of unlabelled children	increased
Frame lines	decreased
Empty spaces	decreased
Having hair on heads	increased
Having distinct necks	increased
Having arms and having them correctly located	increased
Having fingers or thumbs drawn on hands	increased
Having legs and having them correctly located	increased
Profile representation of feet	increased
Feet represented by elipse rather than line	increased
Feet being more proportional	increased
Heels being given	increased
Waisted trunks being given	increased
Complete bodies with solid rather than stick extremities	increased
Omission of clothing	decreased

(ii) Sophistication

Instances of:

Use of the total page space	increased
Complete rather than partial background shading	increased
Indeterminate viewpoint (artist's eye)	decreased
Shading and shading with additional outline of familiar classroom objects	increased
Colouring familiar classroom objects in elaboration or differentiation	increased
Groupings of three or more familiar classroom objects	increased
Use of colour to differentiate facial features	increased
Back and side views of the body	increased
Use of colour to differentiate body parts	increased
"Behind/in front of" relationships	increased
"On/under" relationships	increased
Use of perspective devices	increased
Many colours being used	increased

(iii) Conformity of Content

Instances of:	Ceilings rather than roof or sky as the top boundary.....	increased
	Floors as the bottom boundary.....	increased
	Drawing content from outside of the bounds of the classroom.....	increased
	Inclusion of familiar classroom objects.....	increased
	Windows.....	decreased
	One door rather than multiple doors.....	increased
	Blackboards.....	increased
	Pictures.....	decreased
	Children's furniture.....	increased
	Teacher's furniture.....	increased
	Teacher as the most detailed person.....	increased

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